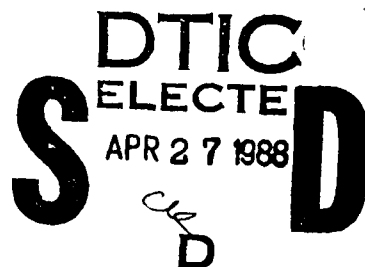Research Report 1468

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National Training Center Performance Trends for Mortar Fire Support: Relationship to Training Doctrine

Ann N. Hamza and Richard K. Williams, Jr.

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report describes a methodological approach developed for the analysis of mortar performance trend data contained in the Fire Support Operating System section of Take Home Packages (THPs) from the National Training Center (NTC). The purpose of the analysis was to determine the efficacy and practicality of the methodology as a feedback mechanism. The methodology categorized the performance trend data so that unit strengths and deficiencies could be identified, and then these findings were linked to relevant Army Training and (Continued)

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ARI Research Report 1468

20. Abstract (Continued)

Evaluation Program (ARTEP) tasks to assist training managers develop optimal
training programs. A parallel study using a larger operating system was
discussed.

National Training Center Performance Trends for Mortar Fire Support: Relationship to Training Doctrine

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Education and Training

The Army Research Institute (ARI) has a major research program in support of the National Training Center (NTC). The purpose of this program is to support improved training at the NTC and development of Lessons Learned methodologies for training, doctrine, organization, personnel, and equipment.

The National Training Center provides the most realistic engagement simulation and live-fire battalion task force training available. Battalions spend 14 days in a simulated combat environment against a well-trained opposing force. They are closely observed by observer/controllers who hold an After Action Review (AAR) for each mission. The results of these AARs, along with performance trends for the entire rotation, are contained in a Take Home Package (THP) for each unit.

This report describes an analysis of the NTC THPs Mortar Performance Trends in the Fire Support Operating System for 14 battalions. Identified issues were referenced to tasks in ARTEP 71-2.

The research effort described in this report was conducted by ARI's Presidio of Monterey Field Unit, whose mission is to increase Army unit combat performance capabilities by improving unit performance measurement and evaluation methods, unit training programs and management tools, and the NTC and home station data base.

The Program Task that supports this mission is entitled "Field Feedback from National Training Center to Improve Collective and Individual Training" and is organized under the Maintain Force Readiness program area. This research was sponsored by the Combined Arms Training Activity under the Letter of Agreement entitled "National Training Center (NTC) and Unit Home-Station Training and Feedback System," dated 16 September 1985. The Combined Arms Training Activity Lessons Learned Division was briefed in July 1986 on the information in this document, and indicated its intention to use the results. The results of this analysis can be useful for the NTC Lessons Learned program; for home station training by providing guidance for training managers to focus training in areas where units have shown consistent weaknesses; and for improved feedback to units at the NTC.

EDGAR M. JOHNSON
Technical Director

NATIONAL TRAINING CENTER PERFORMANCE TRENDS FOR MORTAR FIRE SUPPORT:
RELATIONSHIP TO TRAINING DOCTRINE

EXECUTIVE SUMMARY

Requirement:

The Army Research Institute is currently conducting research for defining requirements for more effective integration of National Training Center (NTC) and Home Station training and is applying methods for measurement and interpretation of unit performance effectiveness to support development of NTC Lessons Learned.

Procedure:

Mortar performance trend data from 14 Take Home Packages (THPs) were analyzed to determine the efficacy and practicality of categorizing comments, deriving areas of strength and weakness, and then linking these findings to relevant Army Training and Evaluation Program (ARTEP) tasks to help training managers at Home Station develop optimal training programs.

Findings:

Assessment of unit performance effectiveness was accomplished using the method defined in this study. Linking performance trend data to ARTEP tasks was found to be feasible and, therefore, has direct training implications for training managers at Home Station. However, an analysis of the data reveals a lack of standardization among mortar Observer/Controller (OC) observations and comments that limits the utility of the data for production of Lessons Learned.

Utilization of Findings:

The matrix of ARTEP tasks and identified categories of mortar issues that was developed can provide a reference for mortar training managers to use in developing training programs focusing on the deficiencies consistently reported by the NTC mortar OCs. A parallel study looks at another operating system, which has a larger sample of performance trend data, to validate the methodology and findings in this study.

NATIONAL TRAINING CENTER PERFORMANCE TRENDS FOR MORTAR FIRE SUPPORT:
RELATIONSHIP TO TRAINING DOCTRINE

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NATIONAL TRAINING CENTER PERFORMANCE TRENDS FOR MORTAR FIRE SUPPORT:
RELATIONSHIP TO TRAINING DOCTRINE

INTRODUCTION

The Army Research Institute is conducting analyses of various data that
have been collected at the National Training Center (NTC) during each training
rotation in order (1) to support development of NTC Lessons Learned, and
(2) to identify ways of improving training at the NTC and Home Station. This
report describes an analysis of NTC Take Home Packages (THPs) which provides
part of the feedback given to units by the NTC Operations Group. The THPs
present a synthesis of the observations made by the NTC Observer/Controllers
(OCs) concerning the performance of the unit during the entire training
rotation and is intended to assist units in improving training at Home
Station.

This study provides a more detailed analysis of the 14 THPs analyzed in an
earlier study by Shackelford (1985). Shackelford analyzed these THPs to
determine whether or not performance of units in each of the seven Operating
Systems*, as reported by the OCs in the form of comments in the Performance
Trend sections, was predominantly adequate or poor. This study extends
Shackelford's methodology by attempting to further categorize comments within
one Operating System in order to identify specific strengths and weaknesses
and, thereby, better reveal possible linkages to existing Army Training and
Evaluation Program (ARTEP) tasks. The Fire Support (FS) Operating System was
selected for analysis. Performance Trend comments within this Operating
System address the use of Field Artillery (FA), Mortars, and Close Air Support
(CAS). For the purposes of this study, Performance Trend comments on mortars
were specifically selected as an appropriate sample to pilot test the
feasibility of the proposed methodology.

Since ARTEPs are the basic training guidance provided to units by U. S.
Army Training and Doctrine Command (TRADOC) proponents, and feedback tied to
the ARTEPs is likely to have more direct relevance for Home Station training,
the issues identified through the analysis accomplished in this report were
then referenced back to those tasks in ARTEP 71-2 (1984) believed to be
applicable. The results of this analysis have value for the NTC Lessons
Learned program, for providing guidance for training managers to focus
training in areas where units have shown consistent deficiencies, and for
improved feedback to units at the NTC.

This paper describes the methodology used, presents the results found by
using this methodology, discusses the possible implication of the results
obtained, and then presents conclusions concerning the feasibility of using
the methodology to derive feedback that can be beneficial in the development
of NTC Lessons Learned and improved training programs at Home Station.

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* Seven Operating Systems: Intelligence, Maneuver, Fire Support, Air Defense,
  Mobility/Countermobility, Combat Service Support, and Command & Control.

METHODOLOGY

In the Mortar Performance Trend section of the THPs, OC comments on strengths and weaknesses are organized into two categories: Planning and Execution. Each comment was listed separately under the applicable category; compound statements were separated into simple sentences. Similar comments of high frequency were then grouped. Subcategories were established using high frequency groupings of essentially identical comments. As the OCs also frequently provided summary comments that reflected general performance, the two major categories of Planning and Execution were supplemented by an overview category. Table 1 lists the categories and subcategories derived by this methodology.

Table 1

Fire support - mortar operating system categories.

OVERVIEW

    Integration of Mortars

PLANNING

    Priority of Fires and Targets

    Coodination/Supervision

    Displacement

    Final Protective Fires

EXECUTION

    Maintain Orientation

    Displacement

    Calls for Fire

    Smoke and Illumination

    Final Assault Fires

    Final Protective Fires

    Communications

    Operate Fire Direction Center

    Reorganize

RESULTS

The results of the analysis of the THPs are presented in the order and format depicted in Table 1. A discussion of the findings under each subcategory is preceded by a list of relevant ARTEP tasks and is followed by a table which summarizes the frequencies of the comments across THPs. These tables indicate if the comments applied to a Mechanized Infantry Task Force (M) or to an Armored Task Force (A), and whether the comment was positive, negative or omitted.

Overview: Integration of Mortars

Relevant ARTEP Tasks:

3-I-1-6   Plan Fire Support.
3-I-1-16   Control Fire Support.

To provide an overall evaluation of the performance of mortars, OC comments concerning overall effectiveness of mortar planning and execution were grouped under this category. Overall, these comments indicated that mortars are not fully integrated into FS plans.

Comments under the planning category specificially addressed integration of mortars into the FS plan. All THPs contained comments specifically on integration, with most identifying serious weaknesses. Fire planning for mortars was not adequate throughout the training for the majority of the battalions. The FS plan did not always provide mortars with specific fire support tasks to execute. According to doctrine, the Fire Support Officer (FSO) is tasked to ensure the integration of mortar fire support into the FS plan. In a discussion with mortar OCs at the NTC, they reported that integration problems with mortars stemmed from minimum involvement of the mortar platoon leader in the OPORD planning. Since he recommends where the fires need to be placed to support the scheme of manueuver, the OCs emphasized the need to develop an aggressive mortar platoon leader who ensures the inclusion of mortars in the Task Force (TF) FS plan. He must make recommendations concerning employment of fire support means and fire support coordination measures, actively develop displacement plans, and consistently coordinate with the FSO and TF commander or Operations and Training Officer (S3). A passive platoon leader will have a mortar platoon that is not fully utilized.

Another integration issue revealed in a discussion with mortar OCs at the NTC addressed interface problems. Most TF commanders do not interface with their mortar platoons during training exercises at home station. The lack of interaction and direct involvement could lead to ineffective employment of mortars by these commanders.

Table 2
Integration of mortars - planning

OC COMMENTS	84A	84M
Positive	3	3
Negative	4	4
Not mentioned	0	0

Comments under the execution category were general in nature and over-whelmingly indicated that indirect fire support from mortars was inadequate during most of the training (Table 3).

Table 3
Integration of mortars - execution

OC COMMENTS	84A	84M
Positive	1	1
Negative	6	6
Not mentioned	0	0

Planning

Priority of fires and targets. Relevent ARTEP Tasks:

3-I-1-6	Plan Fire Support.
3-I-1-7	Coordinate with Higher, Adjacent, and Supporting Units.
3-I-1-8	Issue OPORD.

Priorities of fire and priority targets are established by the S3/TF commander based on the importance of the supported unit's mission. These fires are needed so that when two or more units are calling for fire, the mortar platoon leader has clear guidance as to whom the platoon will support first. Once priorities of fire are established, the Fire Support Coordinator (FSCOORD) is provided guidelines on when targets change priority during the battle. For the majority of battalions, priority of fires was consistently performed and established in the OPORD.

A subsequent planning requirement involves developing a target list. In the THPs analyzed, priority targets were consistently left off of the TF target list. Another problem involved the dissemination of the target lists to the mortar Fire Direction Center (FDC). Half the battalions noted provided this information to the mortar FDC while the other half failed to consistently accomplish this task. As identified in doctrine, the battalion FSO has responsibility for developing and transmitting the target list. Results are summarized in Table 4.

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Table 4
Priority of fires and targets

OC COMMENTS	84A	84M
Priority fires		
Positive	7	4
Negative	0	0
Not mentioned	0	3
Priority targets		
Positive	1	4
Negative	0	0
Not mentioned	6	3
Target list		
Positive	2	0
Negative	1	3
Not mentioned	4	4
Dissemination		
Positive	2	2
Negative	0	4
Not mentioned	5	1

<u>Coordination/supervision</u>.   Relevent ARTEP Tasks:

3-I-1-7	Coordinate with Higher, Adjacent, and Supporting Units.
3-I-1-16	Control Fire Support.
3-IV-19-1 (5-8)	Prepare for Operations.

Most THPs contained comments on coordination and supervision among leaders, with most comments being negative, as shown in Table 5. The OCs reported that coordination among the mortar platoon leader, FSO, S3, and TF commander did not occur during the planning process, which resulted in poor execution of the operation. When they did coordinate, all planning considerations were not sufficiently addressed. Mortar platoon leaders were present during the planning briefing but did not actively participate. In addition, some mortar platoon leaders neglected to sufficiently address all planning considerations.

Other related issues focused on the amount of guidance and supervision provided by the platoon leader to the mortar platoon on specific fire support tasks. The lack of corrective action by the mortar platoon leader contributed to untimely and inaccurate fire support.

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Table 5
Coordination/supervision

OC COMMENTS	84A	84M
Active planning		
Positive	0	3
Negative	1	2
Not mentioned	6	2
Coordination		
Positive	0	1
Negative	0	4
Not mentioned	7	2
Supervision		
Positive	0	0
Negative	2	1
Not mentioned	5	6

<u>Displacement.</u>   Relevent ARTEP Tasks:

    3-I-1-6   Plan Fire Support.
    3-I-1-7   Coordinate with Higher, Adjacent, and Supporting Units.
    3-I-1-8   Issue OPORD.

OCs did not comment on displacement planning very often, and when they did, issues varied. Yet the general trend focused on the effectiveness of planning for and designation of mortar positions to provide continuous support to the TF. Only half the battalions had planned well for mortar displacement (i.e., more specifically, initial and subsequent positioning, Table 6). For the remaining battalions, displacement plans were not addressed in detail. Plans to continuously support specific FS tasks were not developed. One mechanized battalion was noted for not disseminating and staffing displacement plans through the S3, FSO, mortar platoon leader, and the TF commander. As indicated in FM 71-2J (1984), the mortar platoon leader develops a tentative displacement plan as part of his fire plan, and verifies and finalizes the plan before distributing to the S3/battalion commander, Fire Support Team (FIST) chief, FSO, platoon sergeant, and FDC chief. Factors of mission, enemy, terrain, troops and time available (METT-T), should be used to determine displacement techniques used by a mortar platoon on a particular operation. In addition, the maneuver TF commander's OPORD should provide the mortar platoon leader the necessary information and guidance for deciding which of the three displacement techniques to use. These doctrinal issues were not addressed in the THPs.

Although split platoon operations can be considered an employment issue rather than displacement, its significance is considered in this section. In a discussion with mortar OCs at the NTC, they indicated that mortar platoons

do not use split platoon operations, possibly because of an expected loss of volume of fire. These mortar OCs felt that this loss does not occur and, in fact, use of split platoon operations is a very efficient practice which contributes to survivability. Only two THPs contained comments on split platoon operations (Table 6).

Table 6
Displacement planning

OC COMMENTS	84A	84M
Displacement planning		
Positive	2	2
Negative	1	3
Not mentioned	4	2

Final protective fires. Relevent ARTEP Tasks:

3-I-1-6	Plan 'Fire Support.
3-I-1-16	Control Fire Support.

Issues with Final Protective Fires (FPFs) included allocation, coordination, and dissemination (of the FS plan). FPFs were not consistently allocated and included in the TF FS plan, nor coordinated for execution. Furthermore, FPFs were not disseminated to FISTs, artillery, or to the mortar FDCs. These FPF issues addressed mechanized battalion TFs and only one armor battalion TF. Again, comments were few, as shown in Table 7.

Table 7
Final protective fires - planning

OC COMMENTS	84A	84M
Plan FPFs (allocate)		
Positive	1	2
Negative	0	5
Not mentioned	6	0
Coordinate FPFs		
Positive	0	1
Negative	0	2
Not mentioned	7	4
Disseminate		
Positive	0	0
Negative	0	2
Not mentioned	7	5

Execution

Maintain orientation. Relevent ARTEP Task:

3-I-1-10   Maintain Orientation.

About half of the Armor Battalion THPs reported mortar platoon sections were often misoriented, or were lost during an operation. No mention of this issue was noted in the mechanized battalion THPs. Results are summarized in Table 8.

Table 8
Maintain orientation

OC COMMENTS	84A	84M
Positve	0	0
Negative	4	0
Not mentioned	3	7

Displacement. Relevant ARTEP Tasks:

3-IV-19-2	Move.
3-IV-19-4	Reconnoiter a Firing Position.
3-IV-19-5	Occupy and Prepare a Firing Position.
3-IV-19-8	Displace by Echelon.
3-IV-19-9	Conduct Split Platoon Operations.
3-IV-19-10 (5)	Conduct an Emergency Fire Mission (Hipshoot).

Unlike the few OC comments on displacement planning, OCs generally provided comments on displacement execution. These comments were predominantly negative. Specific comments usually related to failures to coordinate movement of mortars with that of maneuver elements and failure to stay within supporting range.

Table 9
Displacement execution

OC COMMENTS	84A	84M
Positive	1	2
Negative	3	5
Not mentioned	3	0

8

Calls for fire. Relevent ARTEP Tasks:

      3-I-1-16   Control Fire Support.
      3-IV-19-19   Fire a Time-on-Target Mission.
      3-IV-19-25   Deliver Scheduled Fires.

The first issue under this subcateogry involves calls for fire. Few calls for fire were directed to the mortars either by field artillery [FSO] or by the FIST, even when mortars were properly positioned to execute fires.

The second issue involves the inablity of mortars to execute calls for fire. When mortars did receive calls for fire, they were unresponsive to these calls, and therefore did not support the TF. This finding could be explained by the previous findings on orientation (pg. 7) and displacement execution (pg. 8).

Table 10
Calls for fire

OC COMMENTS	84A	84M
Positive	2	1
Negative	5	5
Not mentioned	0	1

Smoke and illumination. Relevent ARTEP Tasks:

      3-IV-19-20   Fire an Immediate Suppression/Immediate Smoke Mission.
      3-IV-19-21   Establish a Smoke Screen.
      3-IV-19-22   Fire an Illumination Mission.

OC comments indicated that smoke was frequently used—but usually was not timely or effective. For example, it was not used well to screen TF movements and breaching operations; if used, it was not sustained.

Comments were similar on use of illumination during night operations. Failure to adjust illumination properly and to coordinate with high explosive (HE) fires were some of the mentioned problems. Again, only the mechanized battalion THPs contained comments by OCs on the use of smoke and illumination provided by the mortar platoon.

Table 11
Smoke and illumination

OC COMMENTS	84A	84M
SMOKE		
Positive	0	2
Negative	0	5
Not mentioned	7	0
ILLUMINATION		
Positive	0	2
Negative	0	5
Not mentioned	7	0

Final assault fires. Relevent ARTEP Tasks:

    3-IV-19-20   Fire an Immediate Suppression/Immediate Smoke Mission.

As shown in Table 12, not many comments were directed toward final assaults, and those comments were only from the mechanized THPs. For those battalions mentioned, failure to prepare and set up in time to support final assaults on the objectives were noted. In one case, suppression and neutralization of the objective were initiated but not sustained until requested to be lifted by the lead team.

Table 12
Final assault fires

OC COMMENTS	84A	84M
Positive	0	0
Negative	0	3
Not mentioned	7	4

Final protective fires. Relevent ARTEP Tasks:

    3-IV-19-16   Adjust Final Protective Fire.
    3-IV-19-17   Fire Final Protective Fire.

The execution of FPFs was only mentioned in the mechanized battalion THPs. FPFs were not fired the majority of the time and, when fired, were not timely. (See Table 13.)

Table 13
Final protective fires - execution

OC COMMENTS	84A	84M
Positive	0	0
Negative	0	5
Not mentioned	7	2

Communications. Relevent ARTEP Tasks:

    3-I-1-13   Establish and Maintain Radio Communications.

Loss of radio communications and confusion on mortar nets were identified
as problems in a few TFs (Table 14).

Table 14
Communications

OC COMMENTS	84A	84M
Positive	0	0
Negative	2	1
Not mentioned	5	6

Operate fire direction center. Relevent ARTEP Task:

    3-IV-19-6   Operate Fire Direction Center.

On a few occasions, OCs commented on problems with the Fire Direction
Center (FDC) incorrectly setting up plotting boards and not having correct
firing tables. (See Table 15.)

Table 15
Operate fire direction center

OC COMMENTS	84A	84M
Positive	0	0
Negative	2	1
Not mentioned	5	6

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<u>Reorganize</u>.   Relevent ARTEP Tasks:

3-IV-19-27   Reorganize.

Failure to reconstitute from the previous day's battle was a problem area commented on in Armor battalion THPs. Other problems under reorganization pertained to maintenance. Maintenance problems with the carriers reduced the number of mortars available to support the TF. Also, inadequate maintenance of FDC tracks further weakened TF support. There were no comments for this category in the mechanized battalion THPs.

Table 16
Reorganize

OC COMMENTS	84A	84M
Positive	0	0
Negative	5	0
Not mentioned	2	7

DISCUSSION

Findings

Integration with maneuver. Overall, the data indicated problems for mortar FS in providing support to the TF scheme of maneuver. Fire planning was inadequate throughout training for most battalions; furthermore, mortars were not provided with specific FS tasks. The execution of FS from mortars was also inadequate during most of the training.

Target priorities and timing. Priority of fires and targets were planned well and established in the OPORD for most battalions, yet priority targets were left off the TF target list. Only half the battalions successfully disseminated the target list to the FDC. Also considered a priority fire, FPFs were not consistently allocated and included in the TF FS plan nor were they cooordinated for execution. Again, there were problems in disseminating FPFs to the FIST, artillery units, and the mortar FDC. These problems were most frequently mentioned for mechanized battalions. FPFs were rarely fired by mechanized TFs, and then were not timely.

Planning and coordination among the S3, FSO, and mortar platoon leader were inadequate. Mortar planning considerations were not sufficiently addressed. Platoon leaders were present during planning, yet did not take an active role. Furthermore, mortar platoon leaders were not consistent in providing sufficient guidance to subordinates on FS tasks.

Displacement planning was performed well for half the battalions. A major problem with displacement planning was that it was not in enough detail. Execution of displacement plans was not coordinated, which resulted in mortar platoons not being within supporting range.

Level of employment. Calls for fire were far too few; when calls were made, mortar platoons were unresponsive. As suggested previously, poor FS planning, coordination, and dissemination of information for displacement and priority targets may explain the few calls for fire and the unresponsiveness.

Smoke was employed yet was not timely or effective since it was not used well to screen movements or breaching operations.

Reconstitution. Reorganization problems centered around maintenance problems with both the mortar carriers and FDC tracks which reduced the ability of the mortar platoon to provide adequate indirect fire support. The subcategories of Maintain Orientation, Final Assault Fires, Communications, and Operate FDC did not have enough data to allow generalizations of the comments.

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Implications

The findings can be summarized into two general problem areas: integration with the TF, and execution. Integration involves planning and coordinating the maneuver and fire support requirements with all staff concerned, to ensure that all needs are considered and addressed. Execution involves the communication means available to call for and adjust fires, and the actions of gun crews and FDCs to properly prepare to respond to fire requests.

OC comments concerning the problems with integration are numerous and address the following three areas: the platoon leader, planning, and coordination. There are three implications for the mortar platoon leader. First, he must be active in ensuring that mortar fire suppport is included in the FS plan. Second, he must be tactically and technically competent so that he develops detailed plans that continuously support the needs of the scheme of maneuver and provide sufficient guidance to his subordinates. Third, he must aggressively coordinate with the FSO and S3 to ensure that he receives the target lists and that they are forwarded to the FDCs.

Most of the planning problems noted by the OCs involve the target list. The target lists included priority targets in only half of the Task Forces considered. FPFs for the mortar platoon were specifically mentioned as being omitted. The responsibility for developing the target list belongs to the FSO. He must ensure that it is complete.

The coordination problems involve more than just the mortar platoon leader. OC comments clearly indicate a lack of coordination among the TF commander, S3, FSO, and mortar platoon leader. Doctrine creates a requirement for maneuver and artillery personnel to coordinate their actions during war. The poor coordination observed raises the question of how often these key personnel routinely interact at Home Station. Are the mortar platoons left alone to train separately? Do the FSOs and FISTs routinely train with their maneuver elements? The answers to these issues could explain the poor coordination accomplished between these personnel at the NTC.

As was mentioned above, implications for execution involve the indirect fire communications support system and the actions taken by the gun crews and FDCs. The communications system presents unique problems. First, Armor units do not have FOs; the tank platoon leader must make his own call for fire. His normal duties necessarily preclude him from being able to use all of the various radio nets available for his calls for fire. For Armor units, there-fore, the FSO takes on added importance. Second, FSOs must monitor calls for fire to ensure that the most effective means is employed against a target, while still maintaining maximum resource utilization. He must have a clear charter from the TF commander in order to effectively direct what element responds to which call for fire. Third, FSOs and TF commanders/S3s must thoroughly coordinate the use of special munitions such as smoke and illumination. Timing and accuracy are essential, and their effective employment must be closely monitored.

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OC comments concerning the actions of crews and FDC were not specific enough to identify why an element did not respond to a call for fire, except for those instances when the units were out of range of the target. It is the responsibility of the platoon leader to ensure that he plans for and executes such displacements as necessary to keep up with the battle, while the FSO and S3 must monitor and assist when needed.

Methodology

As was mentioned in the methodology section, the subcategories were developed primarily by grouping items of high frequency. A review of the frequency tables indicates an unequal proportionality between the two OC teams, which implies a lack of standardization of observations of units at the NTC. This necessarily creates reliability and validity issues, especially when comparing types of Task Forces.

The methodology facilitated linking Performance Trend comments to ARTEP tasks by narrowing the scope of the comments to a level that could be more easily compared with ARTEP tasks. This process was slightly complicated by the organization of ARTEP 71-2. ARTEP tasks that cover mortar planning are not specifically addressed under the mortar section of the ARTEP, but rather they come under the more general ARTEP task of Plan Fire Support. This should not detract from the utility of the methodology as a means to assist trainers in developing optimum training programs for mortar platoons. However, this process becomes much more complicated and cumbersome when analyzing larger operating systems or multiple levels. Appendix A provides a matrix that associates the applicable ARTEP task(s) with the subcategories derived from the THPs considered in this report. The completeness of this matrix, however, is dependent on the future variability of OC Performance Trend comments from those considered in this report.

CONCLUSIONS

The findings indicate that the methodology used in this study can be used to analyze THP Performance Trend data on mortars in order to determine areas of strength and weakness of mortars. Furthermore, linking OC comments to doctrine is feasible which should enhance the NTC Lessons Learned program and improve the feedback provided to units who train at the NTC.

The parallel study (Johnson & Williams, 1986) applies these same procedures to a more complex operating system. This provides additional data on standardization issues and reveals the complexity involved in attempting to link OC comments to ARTEP tasks across multiple levels of organization.

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MATRIX OF ARTEP TASKS AND IDENTIFIED ISSUES

CATEGORY	ARTEPS																					
	3 IV 19 27	3 IV 19 25	3 IV 19 22	3 IV 19 21	3 IV 19 20	3 IV 19 19	3 IV 19 17	3 IV 19 16	3 IV 19 10	3 IV 19 9	3 IV 19 8	3 IV 19 6	3 V 19 5	3 IV 19 4	3 IV 19 2	3 IV 19 1	3 I 1 16	3 I 1 13	3 I 1 10	3 I 1 8	3 I 1 7	3 I 1 6
OVERVIEW																						
Integrating Mortars																						X
Plan																	X					
Execute																						
PLANNING																						
Priority Fires & Targets																				X	X	X
Coordination/Supervision																X	X				X	X
Displacement																				X	X	X
FPFs																						X
EXECUTION																						
Orientation																			X			
Displacement									X	X	X		X	X	X							
Calls for Fire				X		X											X					
Smoke		X			X																	
Illumination																						
Final Assaults Fires			X		X																	
FPFs							X	X														
Communication																		X				
Operate FDC												X										
Reorganize	X																					

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